

Date: Fri, 4 Mar 94 04:30:29 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #49
To: Ham-Homebrew

Ham-Homebrew Digest Fri, 4 Mar 94 Volume 94 : Issue 49

Today's Topics:

 FM BROADCAST BAND RF AMP (5 msgs)
 Help understanding FM and SSB
 inductors etched on pcbs
 Looking for sources of ferrite rod
 low voltage Solid State relays
 Series Diodes (was Re: Paralleling Power Diodes ?) (2 msgs)
 Source for "heat Diodes/Semi's" ?
 Want to obtain a very cheap high gain antenna

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Thu, 3 Mar 1994 02:50:29 GMT
From: ihnp4.ucsd.edu!agate!library.ucla.edu!news.ucdavis.edu!chip.ucdavis.edu!
ez006683@network.ucsd.edu
Subject: FM BROADCAST BAND RF AMP
To: ham-homebrew@ucsd.edu

Donald Zarda (dzarda@saucer.cc.umn.edu) wrote:

: Does anyone have plans or know of a way to boost the output of the
: BA1404 stereo chip? I have a small 88-108 MHz stereo transmitter and I
: need to boost the signal to reach about 3 miles. I need something very soon!
: If so please reply. Thanks.

: Blue Skies, BLACK DEATH, DON'T GO SPLAT!!
: "the Fallman"

: Don Zarda
: UNITED STATES PARACHUTE ASSN. MEMBER C-23224
: dzarda@umr.edu
sniff, sniff, do you smell smoke?
:-)

Dan

--

```
*-----*
* Daniel D. Todd      Packet: KC6UUD@KE6LW.#nocal.ca.usa      *
*                    Internet: ddtodd@ucdavis.edu              *
*                    Snail Mail: 1750 Hanover #102             *
*                    Davis CA 95616                           *
*-----*
* All opinions expressed herein are completely fictitious any *
* resemblance to actual opinions of persons living or dead is  *
* completely coincidental.                                     *
*-----*
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Date: 3 Mar 1994 13:58:12 GMT
From: ihnp4.ucsd.edu!ucsnews!sol.ctr.columbia.edu!howland.reston.ans.net!gatech!
news-feed-1.peachnet.edu!umn.edu!mr.net!medtronic.com!jh4658@network.ucsd.edu
Subject: FM BROADCAST BAND RF AMP
To: ham-homebrew@ucsd.edu

Donald Zarda (dzarda@saucer.cc.umn.edu) wrote:

: Does anyone have plans or know of a way to boost the output of the
: BA1404 stereo chip? I have a small 88-108 MHz stereo transmitter and I
: need to boost the signal to reach about 3 miles. I need something very soon!
: If so please reply. Thanks.

Attach a very tall, high gain antenna. :0)

Date: Thu, 03 Mar 94 05:50:51 GMT
From: netcomsv!netcomsv!skyld!janguis@decwrl.dec.com
Subject: FM BROADCAST BAND RF AMP
To: ham-homebrew@ucsd.edu

In article <1994Mar3.004716.5198@umr.edu> dzarda@saucer.cc.umn.edu writes:

> Blue Skies, BLACK DEATH, DON'T GO SPLAT!!
> "the Fallman"

> Don Zarda
> UNITED STATES PARACHUTE ASSN. MEMBER C-23224
> dzarda@umr.edu

Hey DOn, is it true that every parachute is guarenteed to open on impact?

>
Amateur: WA6FWI@WA6FWI.#SOCA.CA.USA.NA | "You have a flair for adding
Internet: jangus@skyld.grendel.com | a fanciful dimension to any
US Mail: PO Box 4425 Carson, CA 90749 | story."
Phone: 1 (310) 324-6080 | Peking Noodle Co.

Date: 3 Mar 94 15:10:33 GMT
From: yuma!galen@purdue.edu
Subject: FM BROADCAST BAND RF AMP
To: ham-homebrew@ucsd.edu

In article <CM2IK7.HCG@ucdavis.edu> ez006683@chip.ucdavis.edu (Daniel D. Todd)
writes:

>Donald Zarda (dzarda@saucer.cc.umd.edu) wrote:
>: Does anyone have plans or know of a way to boost the output of the
>: BA1404 stereo chip? I have a small 88-108 MHz stereo transmitter and I
>: need to boost the signal to reach about 3 miles. I need something very soon!
>: Don Zarda
>: dzarda@umr.edu
>sniff, sniff, do you smell smoke?
>:-)
>Dan

No, but there's three plain, white vans crusing up and down the street
and they have some really cool antennas, but no ham-call license plates.
I'm leaving now.
Galen, KF0YJ

Date: 3 Mar 1994 15:48:23 GMT
From: ihnp4.ucsd.edu!mvb.saic.com!news.cerf.net!usc!elroy.jpl.nasa.gov!
news.larc.nasa.gov!grissom.larc.nasa.gov!kludge@network.ucsd.edu
Subject: FM BROADCAST BAND RF AMP
To: ham-homebrew@ucsd.edu

In article <1994Mar3.004716.5198@umr.edu> dzarda@saucer.cc.umd.edu (Donald Zarda)
writes:

>
> Does anyone have plans or know of a way to boost the output of the

>BA1404 stereo chip? I have a small 88-108 MHz stereo transmitter and I
>need to boost the signal to reach about 3 miles. I need something very soon!
>If so please reply. Thanks.

Sure, no problem.... I got a pair of 4CX1000s here in the junkbox that will
do the job nicely, and I think Fair Radio has appropriate cavities. You'll
probably need more drive power, but I bet a 4164 will give you enough nicely,
and you can set a nice yagi up and point it directly to your local FCC field
office. You wouldn't happen to know where your local FCC field office is?
Maybe someone might want to give them a call.

--scott

--

"C'est un Nagra. C'est suisse, et tres, tres precis."

Date: Thu, 3 Mar 1994 03:10:30 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!
howland.reston.ans.net!vixen.cso.uiuc.edu!sdd.hp.com!col.hp.com!srngenprp!
alanb@network.ucsd.edu
Subject: Help understanding FM and SSB
To: ham-homebrew@ucsd.edu

Jason Saunders (maupb@csv.warwick.ac.uk) wrote:

: I've read the RSGB's RAE manual, and still have difficulty with their
: descriptions of FM and SSB. In FM, as I understand, the frequency of the
: carrier is modulated by the amplitude of the speech. So why does the bandwidth
: of the RF signal matter? If you have, say a 28Mhz carrier and the bandwidth of
: the Rf signal is 5kHz, why should that limit the audio bandwidth to 5Khz?

It doesn't. It's perfectly OK to use a modulation index of less than 1 (that
is, modulating frequency is greater than deviation), but it is normally not
done because of reduced signal-to-noise ratio.

Why? Let's say you modulate at a 20 kHz rate but with only 5 kHz deviation.
The sidebands are located at +/- 20 kHz from the carrier. That means that
your receiver bandwidth must be 40 kHz, even though the peak-to-peak
deviation is only 10 kHz. Wider bandwidth means more noise. If you had
used 20 kHz deviation, you would have had a 4 times louder signal with
about the same required receiver bandwidth.

: The other thing is SSB. I get the general idea of using power more efficiently
: by sending half the audio waveform as the other half is going to be a mirror
: image, and removing the carrier as we want to concentrate power on the signal
: instead of the carrier. What I don't get is how one removes the carrier and
: then adds it back again. Can someone explain that, please?

The normal way is to use a balanced modulator which outputs the sum and difference frequencies (carrier +/- modulation = the two sidebands) while suppressing the carrier. You could also generate conventional AM (using an unbalanced modulator) and use a sharp-tuning crystal filter to filter out the carrier and unwanted sideband.

At the receiver, you simply generate an unmodulated signal at the same frequency as the (suppressed) carrier of the SSB signal and add the two together before demodulation. (Actually, most receivers are superhets which convert the received signal down to an intermediate frequency, so the carrier is generated at that frequency.)

AL N1AL

Date: 4 Mar 94 02:43:11 GMT
From: news-mail-gateway@ucsd.edu
Subject: inductors etched on pcbs
To: ham-homebrew@ucsd.edu

"Radio Engineer's Handbook" by Fredrick E. Terman, 1943 has formulas and correction tables for flat spiral inductors in circular, rectangular, and square shapes. Since the pcb traces are differently shaped than round wire or flat wound strip, the formulas will be starting points. These coils are in free space away from ground planes, so single sided pcb construction is equivalent. I think Terman also analyzes self resonance due to distributed capacitance in inductors generally.
73 Jeff KD6MNP Jfurman@spa.mhs.compuserve.com

Date: Thu, 3 Mar 1994 00:51:06 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!agate!howland.reston.ans.net!gatech!swrinde!sgiblab!pacbell.com!ptsfa!dmtur@network.ucsd.edu
Subject: Looking for sources of ferrite rod
To: ham-homebrew@ucsd.edu

In article <drew.111.0@trl.oz.au> drew@trl.oz.au (Drew Diamond) writes:

>
>The most well-known supplier of ferrite materials for radio/electronic
>applications would perhaps be;
>
> Amidon Associates, 12033 Otsego St, North Hollywood, Ca.
> 91607.
>

Amidon has moved (twice). Their new address is:

Amidon Associates Inc.
2216 East Gladwick Street
Dominguez Hills, CA 90220

(310) 763-5770
(310) 763-2250 FAX

--

Dave Turner (510) 823-2001 {att,bellcore,sun,ames,decwrl}!pacbell!dmtur

Date: 3 Mar 1994 02:38:09 GMT
From: ihnp4.ucsd.edu!mvb.saic.com!news.cerf.net!usc!howland.reston.ans.net!
usenet.ins.cwru.edu!odin!trier@network.ucsd.edu
Subject: low voltage Solid State relays
To: ham-homebrew@ucsd.edu

In article <2l2nf2\$aov@jericho.mc.com>, Bob Levine <levine@mc.com> wrote:
>The relays must be able to turn on using the parallel port data lines
>voltage to switch in various resistor values to the remote control
>port.

Will a CMOS 4066 or its 4016, 4052, 4053, 4529, 4051, or 4551 cousins
work? They are very low-power -- max. quiescent current is measured in
microamps. Try powering them off a control line that you don't plan to
use for signalling.

These things have an on-resistance of ~300 ohms, an off-resistance on
the order of 10^9 ohms, and can not switch voltages outside of their
supply rails. Supply voltage is anything from -0.5V to +18V.

Stephen

--

Stephen Trier KB8PWA "What's the human race going to do next?
Other: trier@ins.cwru.edu Grind up clarinets and smoke them?"
Home: sct@po.cwru.edu - narcotics agent Greg Elam,
quoted on Clarinet

Date: 3 Mar 94 07:19:43 GMT
From: news-mail-gateway@ucsd.edu
Subject: Series Diodes (was Re: Paralleling Power Diodes ?)

To: ham-homebrew@ucsd.edu

In article <CLyBM1.Cy7@srigenprp.sr.hp.com>, Alan Bloom (alanb@sr.hp.com) writes:

>
>I hate to bring up the next point because, since it violates conventional
>wisdom, it is bound to draw some flames. But what the heck...
>
> You don't need to put resistors in parallel when you string
> diodes in series.
>
>There, I've said it.
>
>Think about it. When you over-voltage a diode, it acts like a high-voltage
>Zener and clamps at its breakdown voltage. So long as the current is
>limited, no permanent damage occurs. Since all the diodes in the string
>are in series, the current through each is the same. The current will be
>limited to the leakage current of the lowest-leakage diode in the string,
>typically a few microamps. Unless you exceed the SUM of the breakdown
>voltages of all the diodes in the string, no catastrophic breakdown
>will occur.
>
>

I understand what you're saying, but it still scares me. Without the resistors the reverse voltage will divide very unevenly across the diodes, depending on their individual leakage. Thus in a string of diodes it seems likely that you'll have one or two reaching their Zener "knee" every cycle. I realize that once that happens the other diodes will take the remaining voltage because of the increased leakage current of the zenering (did I just invent a word?) diode. The question is: does that cause any long-term degradation of the diodes. The only case I know that's even remotely similar is that of using the emitter-base junction of a transistor as a zener, after which they say it's not worth much as a transistor any more.

Not looking for flames, just understanding...

Mike, KK6GM

Date: Thu, 3 Mar 1994 03:14:30 GMT
From: ihnp4.ucsd.edu!agate!howland.reston.ans.net!vixen.cso.uiuc.edu!sdd.hp.com!
col.hp.com!srigenprp!alanb@network.ucsd.edu
Subject: Series Diodes (was Re: Paralleling Power Diodes ?)
To: ham-homebrew@ucsd.edu

Michael Silva (mjsilva@ted.win.net) wrote:

:
: In article <CLyBM1.Cy7@srgenprp.sr.hp.com>, Alan Bloom (alanb@sr.hp.com) writes:
: >
: > You don't need to put resistors in parallel when you string
: > diodes in series.
: >
: I understand what you're saying, but it still scares me. Without the
: resistors the reverse voltage will divide very unevenly across the
: diodes, depending on their individual leakage. Thus in a string of
: diodes it seems likely that you'll have one or two reaching their
: Zener "knee" every cycle. I realize that once that happens the other
: diodes will take the remaining voltage because of the increased leakage
: current of the zenering (did I just invent a word?) diode. The
: question is: does that cause any long-term degradation of the diodes.
: The only case I know that's even remotely similar is that of using the
: emitter-base junction of a transistor as a zener, after which they say
: it's not worth much as a transistor any more.

Yes, I have seen degradation of a transistor's beta when the base-emitter junction is reverse-biased for a relatively long period of time. Frankly, I'm not sure what causes that effect. But I have never heard of degradation of diode characteristics from reverse-biasing as long as the current is held to a low value. Don't forget, we're talking only a few microamps here, since the current flow will be limited by the lowest-leakage diode in the string.

AL N1AL

Date: 3 Mar 1994 16:27:28 GMT
From: news.acns.nwu.edu!math.ohio-state.edu!sdd.hp.com!col.hp.com!
dis@network.ucsd.edu
Subject: Source for "heat Diodes/Semi's" ?
To: ham-homebrew@ucsd.edu

This may be off area but does anyone know of
a source (hopefully surplus and cheap) for
the semiconductor/devices used to cool chips etc.
You put DC in and one side gets hot by drawing
heat from the other side. They use them to
make those hot/cool 'coolers' and to cool
chips and stuff.
An address / phone would be nice.

Date: 2 Mar 1994 23:36:37 GMT

From: ihnp4.ucsd.edu!mvpb.saic.com!news.cerf.net!usc!howland.reston.ans.net!
cs.utexas.edu!news.tamu.edu!leviathan!oconnell@network.ucsd.edu
Subject: Want to obtain a very cheap high gain antenna
To: ham-homebrew@ucsd.edu

Roy Allen Sutton (rsutton@congo.EECS.Berkeley.EDU) wrote:

: Has anyone a suggestion for a very cheap highly directional
: 2M antenna?

September 93 issue of 73 Magazine had an article on how to convert a
TV antenna to a 2M beam. I have been told that you can buy the parts
from Texas Towers for about \$20 to do the same.

: Homemade Yagi?

: Homemade Dish? (Do hams use dish on 2M)?

: If you have references, please share them.

: Thanks for any help,
: Roy

```

// internet: oconnell@leviathan.tamu.edu // Ma Bell //
// HAM Radio: KC5DWB The handle is Bob // Day (409) 291-5354 //
// U.S. Mail: R. E. O'Connell // Fax (409) 291-5344 work //
// 11749 Wrong Rd. // Night (409) 589-2016 //
// Bryan, Texas 77808 // Modem wrong (409) 589-2159 //
//
|| From LINUX (wrong) to LINUX (leviathan) to the world of internet ||
||=====||

```

Date: Thu, 3 Mar 1994 17:17:13 GMT

From: news.acns.nwu.edu!math.ohio-state.edu!howland.reston.ans.net!gatech!wa4mei!
ke4zv!gary@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <mbuttsCLvAGM.AKD@netcom.com>, <1994Mar2.080510.26398@ke4zv.atl.ga.us>,
<2l2a44\$iij@blkbox.blkbox.COM>

Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)

Subject : Re: Challenge: Cheapest (least expensive) homeb

In article <2l2a44\$iij@blkbox.blkbox.COM> borm@blkbox.COM (Eric Borm) writes:

>gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>>modern ICs and FM. Using the Motorola MC2833 single chip transmitter

>>and the MC131135 single chip receiver, you can easily build a low

>>power crystal controlled HT. With a synthesizer chip added, a full
>
>I believe you're referring to the MC13135 (rather than 131135)

Yeah, keyboard stutter. :-)

>>Motorola offers evaluation kits (free if you have the right letterhead)
>>including chips, circuit boards, and instructions for these chips. It's
>
>My very recent Motorola databook doesn't mention these evaluation kits.
>The book I refer to is the Communications Device Data book DL136/D Rev 3.

Call'em up. I did after seeing the writeup in Quarterly Devices. Got
a MC2833 kit and a MC13135 kit.

>I'm not sure how simple these circuits are to understand. The receiver
>schematic includes approx 35 components. Both examples given are tuned
>to 49.7 MHz, so adjustments would need to be made for HAM use.

Seemed simple enough to me. There are 27 parts counting all the resistors
and bypass caps, but there are only 5 critical components aside from the
chip itself, and only one of those needs to be changed to scale the
frequency, the first L0 crystal. The chip is rated to 200 MHz, but I've
pushed it as high as 223 MHz with little or no loss of performance.
Note that it takes about 0.75 microvolt for 12 db SINAD, so you might
want to add a RF stage and bandpass filter ahead of the kit for good
performance. A tuned input would be a good idea in any case to limit
image and intermod problems. In a transceiver this could be a common
input/output network.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

End of Ham-Homebrew Digest V94 #49
